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Suspensions: From Micromechanics to Macroscopic Behavior

John F. Brady

California Institute of Technology

It's morning. You pour cereal in your bowl, shake the orange juice, fill your glass, and pour milk over your cereal. Why did you shake the orange juice and not the milk? Why do you pour cereal? These are just some everyday examples of complex fluids -- materials that often behave like water or air, but just as often display quite different behavior. Many complex fluids are in the form of particles dispersed in a host liquid or gas, and it is the particle-level interactions that give rise to interesting macroscopic phenomena, such as shear thinning and thickening, viscoelasticity and structure formation. This talk will discuss the micromechanics of particulate dispersions and how the interplay of colloidal, Brownian and hydrodynamic forces sets the material's microstructure and determines its macroscopic properties. So why did you shake the orange juice and not the milk?